

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Patent Application No. 10/536,494

Confirmation No. 6551

Applicant: Hoffmann et al.

Filed: May 25, 2005

TC/AU: 1796

Examiner: Gregory Listvoyb

Docket No.: 235811 (Client Reference No. 059P 0579)

Customer No.: 23460

**APPELLANTS' REPLY BRIEF**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

In further support of their Appeal Brief dated March 6, 2008, and in response to the Examiner's Answer dated May 29, 2008, Appellants submit this Reply Brief.

*Grounds of Rejection to be Reviewed on Appeal*

Claims 1-5, 7, 9, and 11-18 allegedly are obvious in view of U.S. Patent 6,291,633 (Nakamura) in combination with U.S. Patent 5,786,086 (Frihart et al.) as evidenced by U.S. Patent Application Publication 2003/0126788 (Uang et al.) under 35 U.S.C. § 103(a). Claims 6, 8, and 10 allegedly are obvious in view of Nakamura in combination with Frihart et al. and U.S. Patents 4,680,379 (Coquard 1) or 4,826,951 (Coquard 2) or Japanese Publication 05-125184 (Drawert) under 35 U.S.C. § 103(a). Appellants maintain that the obviousness rejections in view of Nakamura, Frihart et al., Uang et al., Coquard 1, Coquard 2, and Drawert are improper and should be reversed.

*Discussion of the Rejected Claims*

The appealed claims are directed to semi crystalline, melt processible, partially aromatic copolyamides and a method of preparing moulded articles comprising the same. The copolyamides of the present invention are producible by condensation of at least the following monomers or precondensates thereof: a) terephthalic acid, b) at least one dimerised

fatty acid with up to 44 carbon atoms, wherein the dimerised fatty acid has a trimerised fatty acid content of at most 3% by weight, and c) at least one aliphatic diamine of the formula  $\text{H}_2\text{N}-(\text{CH}_2)_x-\text{NH}_2$ , wherein x means a whole number from 4-18, with the proviso that when the partially aromatic copolyamide is produced by condensation of the monomers or precondensates a), b), and c) where x is 6, and further d) adipic acid, the melting point of the copolyamides is at least 265°C as measured by Differential Scanning Calorimetry (DSC).

The semi crystalline, melt processible, partially aromatic copolyamides of the present invention exhibit increased toughness and can be produced according to methods known in the art (see, for example, the application as filed at page 2, line 26 - page 3, line 6 and page 14, lines 5-10 (Table 3)).

*Summary of Appellants' Reply to Examiner's Answer*

The discussion herein is in direct response to the Examiner's Answer. Appellants maintain all arguments of record and those discussed herein. In summary, Appellants' reply to the Examiner's Answer with respect to the obviousness rejections is as follows:

- The Office has not established a *prima facie* case of obviousness regarding Nakamura, Frihart et al., and Uang et al.;
- The Office sets forth statements not supported by any of the cited references;
- The Office has not established why one of ordinary skill in the art would use the polyamide precursor of Frihart et al. when Frihart describes only the benefits of the acrylate modified aminoamide resin final product;
- The Office offers contrary statements with respect to the addition of dimerised fatty acids; and
- In contrast to the Office's allegation of "common scientific assessment," Appellants' copolyamide of the appealed claims exhibits *increased toughness* with the addition of dimerised fatty acids.

*Detailed Discussion of the Examiner's Answer**A. Obviousness Rejection of Claims 1-5, 7, 9, and 11-18 Over Combination of Nakamura and Frihart et al., as evidenced by Uang et al.*

This is a reply to the Examiner's Answer mailed May 29, 2008. In response to the Examiner's Answer, Appellants maintain that the Office has failed to present a *prima facie* case of obviousness in any of the Office Actions or the Examiner's Answer. More specifically, the Office has failed to set forth the information required in a proper obviousness determination (i.e., "a *Graham* factor analysis").

At the paragraph bridging pages 3 and 4 of the Appeal Brief, Appellants requested that the Office set forth a proper obviousness determination. However, the Examiner's Answer again does not recite the differences between the claimed invention and the prior art (the second factor). On page 10, first paragraph, of the Examiner's Answer, the Office acknowledges that Nakamura does not teach a copolyamide comprising dimerised fatty. On page 10, second paragraph, of the Examiner's Answer, the Office states that "Frihart teaches the same class of polyamide, since it comprises all the major ingredients of Nakamura's material. Frihart teaches dimerized fatty acid in his polyamide." Appellants response is that this statement merely recites alleged similarities of the prior art references to each other. The Office has failed to set forth the differences between *the appealed claims and the disclosure of Frihart et al.*

On page 5, third paragraph, of the Examiner's Answer, the Office states that Frihart et al. discloses semi crystalline, melt processable copolyamides, producible by condensation of terephthalic acid, adipic acid, C36 dimerised fatty acid with trimer content of 1-35% wt of tribasic acid at column 5, line 30. In response, Appellants note that the cited passage of Frihart et al. (i.e., column 5, line 30) recites only the word "acids." Appellants further note that Frihart et al. does not disclose the specific combination of elements as cited by the Office.

Appellants requested that the Office acknowledge that Frihart et al. describes a functionalized polyamide that is different than both the present invention and Uang et al. (see the Appeal Brief dated March 6, 2008, paragraph bridging pages 4-5). On page 12, first paragraph of the Examiner's Answer, the Office states that "it is well known that polyamide containing significant amount of terephthalic acid having [sic] better mechanical strength and heat resistance than polyacrylates." The Office does not provide any support for this

statement. Appellants did not find any support for this statement in the disclosure of Frihart et al. In response, Frihart et al. discloses that the present invention is directed to methods for making improved electrically insulated conductive wires comprising insulating material prepared from a curable *acrylate modified* aminoamide-resin prepared from a polyamide *intermediate* (see column 2, lines 46-56). Frihart et al. teaches that it is advantageous to use a resin comprising a multiplicity of acrylate ester groups (see column 3, lines 2-5). In contrast to the Office's statement that polyamides containing terephthalic acid have better properties than polyacrylates, Frihart et al. teaches that it is advantageous to use polyamides that have been modified with polyacrylates.

In the paragraph bridging pages 4-5 of the Appeal Brief, Appellants stated that the Office has not set forth why one of ordinary skill in the art would knowingly combine the polyamide resin *precursor* of Frihart et al. with the copolyamide of Nakamura et al. rather than further functionalize the resin, as directed by Frihart et al. The Examiner's Answer fails to establish why one of ordinary skill in the art would use a polyamide intermediate containing terephthalic acid in place of the polyacrylate final product taught by Frihart et al. By emphasizing the desire to use an acrylate modified aminoamide resin, the disclosure of Frihart et al. effectively teaches away from the use of polyamides that do *not* comprise polyacrylates.

On page 5, fifth paragraph, of the Examiner's Answer and on page 3, third paragraph of the Office Action issued August 8, 2007, the Office states "large fragments of Tribasic fatty acid (C54) decreases [the] melting point of a polyamide, creates irregularities in crystalline structure and eventually decreases such mechanical properties as toughness (Young Modulus)." On page 6, second paragraph of the Appeal Brief, Appellants requested that the Office cite specific support for this allegation or withdraw the statement. The Office still has not cited support for this statement.

On page 5, fourth paragraph, of the Examiner's Answer, the Office states that Uang et al. discloses that the "mechanical properties of dimerised fatty acid-based polyamide is greatly affected be [sic – by] the nature of the acid (i.e., ratio between monomeric, dimeric, trimeric and polymeric fractions (see line 0044))." In response to Appellants' request that the Office show specific support for this statement, the Examiner's Answer indicates on page 12, third paragraph, that "on line 0044 Uang discloses that dimerised fatty acids normally represent a mixture of monomeric, dimeric and polymeric species." In the absence of a

specific page number to accompany line 0044, a specific citation for this statement still has not been provided.

In response, Appellants note that *paragraph* 0044 of Uang et al. states, “[t]he physical properties of polyamides of this type are determined to a large extent by the identity of the dimer acids used in their production.” *Paragraph* 0044 of Uang et al. also states, “[t]he dibasic or polybasic acids are normally mixtures of materials.” These two statements by Uang et al.: (1) the physical properties of a polyamide are determined to a large extent by the dimer acid starting material and (2) dibasic and polybasic acids are a mixture of materials are not equivalent to, and do not support, the Office’s allegation that Uang et al. discloses that the *ratio* between monomeric, dimeric, trimeric and polymeric fractions *affects the mechanical properties of dimerised fatty acid-based polyamides* (emphasis added). Applicants respectfully maintain that Uang et al. does not disclose what the Office has purported.

On page 11, second and third paragraph, the Office states that Uang et al. was cited to illustrate that one of ordinary skill in the art would know that dimerised fatty acids decrease strength and toughness of a polyamide, but increase the flexibility. On page 13, third paragraph of the Examiner’s Answer, the Office states that Applicants’ statement that in the present invention copolyamides with dimerised fatty acids increase toughness is not clear. In response, toughness of polyphthalamides can be expressed by their impact strength and notched impact strength, and often also by the elongation at break (see page 2, lines 19-24 of the present application as filed). As shown in Table 3 of the present application, copolyamides of the present invention surprisingly exhibit increased impact strength (IS), increased notched impact strength (NIS), and increased elongation at break (EB) when compared to similar copolyamides *without* dimerised fatty acids (see page 14, lines 5-10). The increased IS, NIS, and EB of the copolyamides directly correlate to increased toughness.

On page 13, third paragraph of the Examiner’s Answer, the Office contends that based on common scientific assessment, introduction of dimerised fatty acid cannot increase toughness. Therefore, the Office suggests that the use of dimerised fatty acid in a copolyamide in order to increase toughness contradicts the knowledge of one of ordinary skill in the art. Indeed, as discussed above, Appellants’ have unexpectedly (and contrary to the Office’s assertion) found that the addition of dimerised fatty acids in partly aromatic copolyamides *increases* toughness (see, e.g., Table 3 of the present application).

Since the Office contends that it is a “common scientific assessment” that a dimerised fatty acid cannot increase toughness in a polyamide (page 13, third paragraph of Examiner’s Answer; emphasis added), it is unclear why the Office would then turn around and allege that one of ordinary skill in the art would modify the disclosure of Nakamura to include a dimerised fatty acid as allegedly taught by Frihart et al with the expected benefit of a more regular structure and *increased* toughness (see, e.g., the Examiner’s Answer, page 6, second and fourth paragraphs). These two statements by the Office are in direct contrast with one another. If anything, the Office’s statements regarding “common scientific assessment” evidence the unobviousness of the present invention in view of the cited references.

In view of the foregoing, the Office has not met its burden to establish a *prima facie* case of obviousness. Moreover, the subject matter of the appealed claims is predicated on a surprising and unexpected property of the copolyamide. Accordingly, Appellants submit that the present invention, as defined by the appealed claims, is not obvious in view of the combination of Nakamura, Frihart et al., and Uang et al.

*B. Obviousness Rejection of Claims 6, 8, and 10 Over Combination of Nakamura, Frihart et al., and Coquard 1 or Coquard 2 or Drawert*


On page 13, fourth paragraph, of the Examiner’s Answer, the Office states that Appellants have not presented any arguments regarding Coquard 1, Coquard 2, and Drawert. In response, Appellants respectfully disagree. As set forth in Appellants’ Appeal Brief dated March 6, 2008, at page 8, second paragraph, rejected claims 6, 8, and 10 are dependent on claim 1. Independent claim 1 is not obvious based on the combination of Nakamura and Frihart et al., as evidenced by Uang et al. Coquard 1, Coquard 2, and Drawert do not compensate for the deficiencies of Nakamura, Frihart et al., and Uang et al. Specifically, neither Coquard 1, Coquard 2, nor Drawert teach or suggest adding dimerised fatty acids to increase toughness of a polyamide composition.

Therefore, the subject matter of claims 6, 8, and 10 cannot be said to have been obvious in view of the cited references, and this obviousness rejection should be withdrawn.

*Conclusion*

For the reasons given in this Reply Brief and in the Appeal Brief, Appellants respectfully request the reversal of the obviousness rejections of the subject patent application.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Kristen J. Harren", is written over a horizontal line.

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